

ABSTRACT OF DISCLOSURE

A supercritical fluid jet generating device (1) wherein a pulse valve (5) is used to supersonic - jet a mixture of a supercritical fluid and a non-volatile sample or a mixture of a supercritical fluid and a pyrolytic sample and obtain a supersonic jet expansion, the supersonic jet expansion is introduced via a skimmer (8) into a differential evacuation chamber (10) under a high vacuum of at least 10^{-5} Torr, the jet expansion is passed through a skimmer (12) to obtain a molecular beam (M) under a high vacuum of at least 10^{-7} Torr, an intermolecular-collision-free sample molecule in the lowest energy level or the molecule aggregate ion of the sample molecule is obtained from the molecular beam (M) in a laser ionization chamber (13) by means of a resonance multi-photon ionizing method by a wavelength variable laser (L), and the ion is mass-analyzed. Thus, the lowest energy level data on a non-volatile or pyrolytic molecule or the molecule aggregate of that molecule and a thermally-unstable molecule or the molecule aggregate of that molecule or the like is obtained.